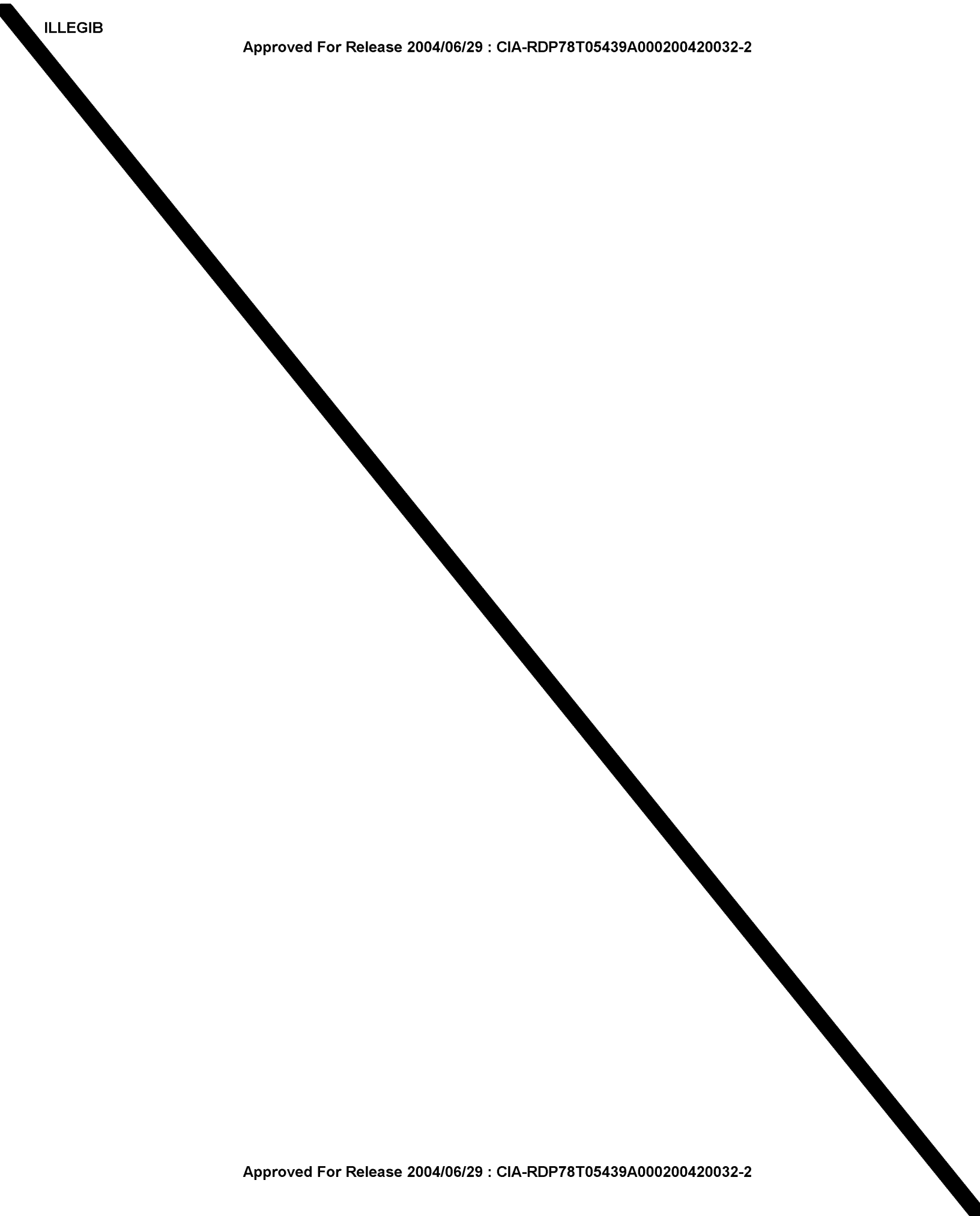

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PHOTOGRAPHIC INTERPRETATION REPORT

CUBAN INTERNATIONAL COMMUNICATION / BROADCAST STATIONS

NPIC/R-1519/63
October 1963

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

NPIC/R-1519/63

SUMMARY

Detailed analysis of the six international radio communication/broadcast stations detected on photographic coverage of Cuba through [redacted] indicates the probability of a point-to-point communication/broadcast capability with Moscow, with nearly all of the capital cities of Central and South America, with many of the capital cities of Central Europe, and probably with certain countries of Central Africa.

25X1D

INTRODUCTION

This study, made possible through the larger scale and greater detail of recent photography, presents precise data on the six presently known international radio stations in Cuba, including several previously unreported locations. All six are in the general area of Havana (Figure 1 and Table 1). A subsequent report is expected to cover internal Cuban communication facilities.

Utilizing the more comprehensive photographic coverage now available, not only can the approximate frequency range be estimated,** but it is also possible to align the antennas with such accuracy that in most cases the probable correspondent can be determined. Thus, of the majority of the 73 long-range antennas detected, the great circle projection of their orientation azimuth passes through a single capital city. Further, certain capitals, such as Moscow, are intersected by more than one antenna orientation azimuth projection from more than one station. Therefore, it would appear that with few exceptions the stations operate on a point-to-point rather than general broadcast basis.

The information produced by this study is presented in graphical and tabular form. For each of the six stations reported on, there is 1) an annotated photograph (Figures 2 through 7); 2) a table of measurements and other data (Tables 2 through 7); and 3) a world map showing the probable correspondent of each antenna (Figures 8 through 13).

Generally, no distinction is made between those antennas used for radio communication and those used for radio broadcasting, as this function is not determinable from aerial photography, the sole source utilized in the preparation of this report. However, detailed examination did determine the design of the antennas to be such that they could be adapted to perform either function on the point-to-point basis mentioned above.

In addition, unless there is no doubt as to an antenna's directivity, the tables show both the forward and back (180 degree opposite) orienta-

25X1D [redacted]

**The method for calculating frequencies was derived from the rhombic antenna design chart, Figure 5-18, page 179, of The A.R.R.L. Antenna Book. 1

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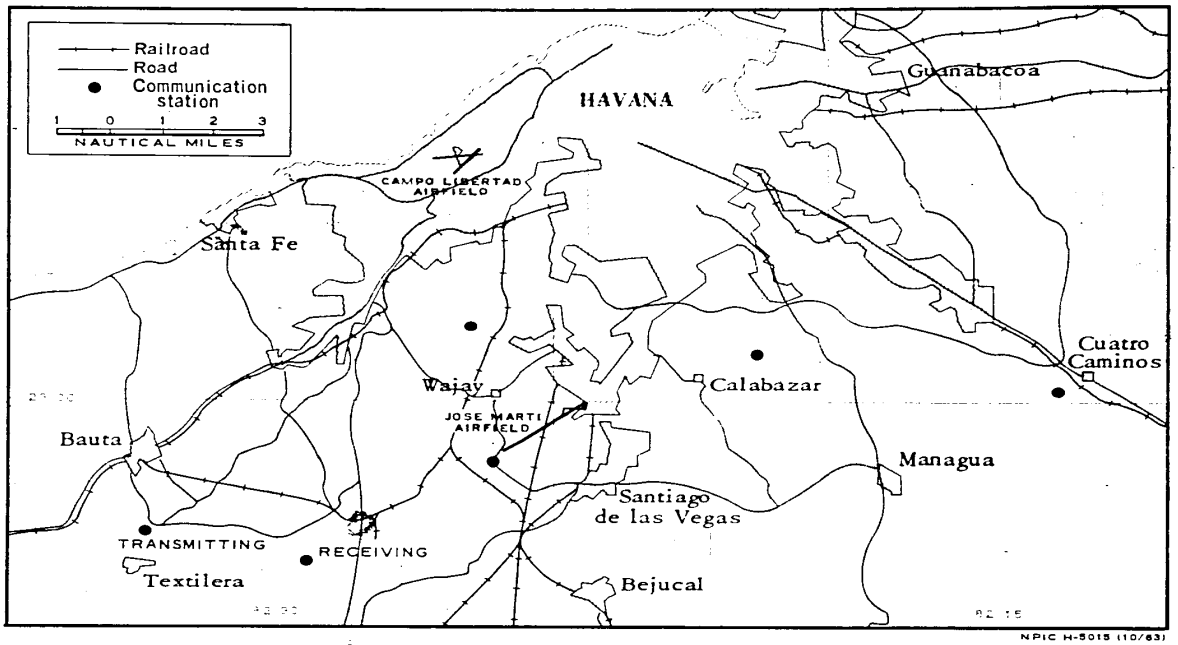

FIGURE 1. LOCATION OF INTERNATIONAL COMMUNICATION/BROADCAST STATIONS.

tion azimuths. This is necessary with many receiving rhombic antennas, for example, since there is no dissipation line and propagation could be off either end of the antenna. In such cases, no attempt was made through collateral intelligence to determine the actual correspondent, but the most likely entered in the forward projection column as determined from photographic evidence alone. Thus, if an antenna is beamed in one direction through a field of other antennas, while the opposite end has a clear "field of fire," then the clear end will be shown as the forward projection entry unless some further consideration takes precedence.

Table 1. Coordinates of Communication/Broadcast Stations

Station	Coordinates	Location
Bauta Transmitting	22-56-48N 82-32-42W	2.2 nm south of town, 14 nm SW of central Havana
Bauta Receiving	22-56-18N 82-29-24W	3.2 nm east of Bauta Transmitting Station
Calabazar	23-01-00N 82-20-00W	2.1 nm east of town
Santiago de las Vegas	22-58-36N 82-25-36W	Off SW end of Jose Marti Airfield, 2.1 nm WNW of town
Cuatro Caminos	23-00-15N 82-13-45W	0.6 nm west of town
Wajay	23-01-42N 82-26-00W	1.6 nm NNW of town, in SSW environs of Havana

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FIGURE 2. BAUTA TRANSMITTING STATION, [redacted]

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25X1D

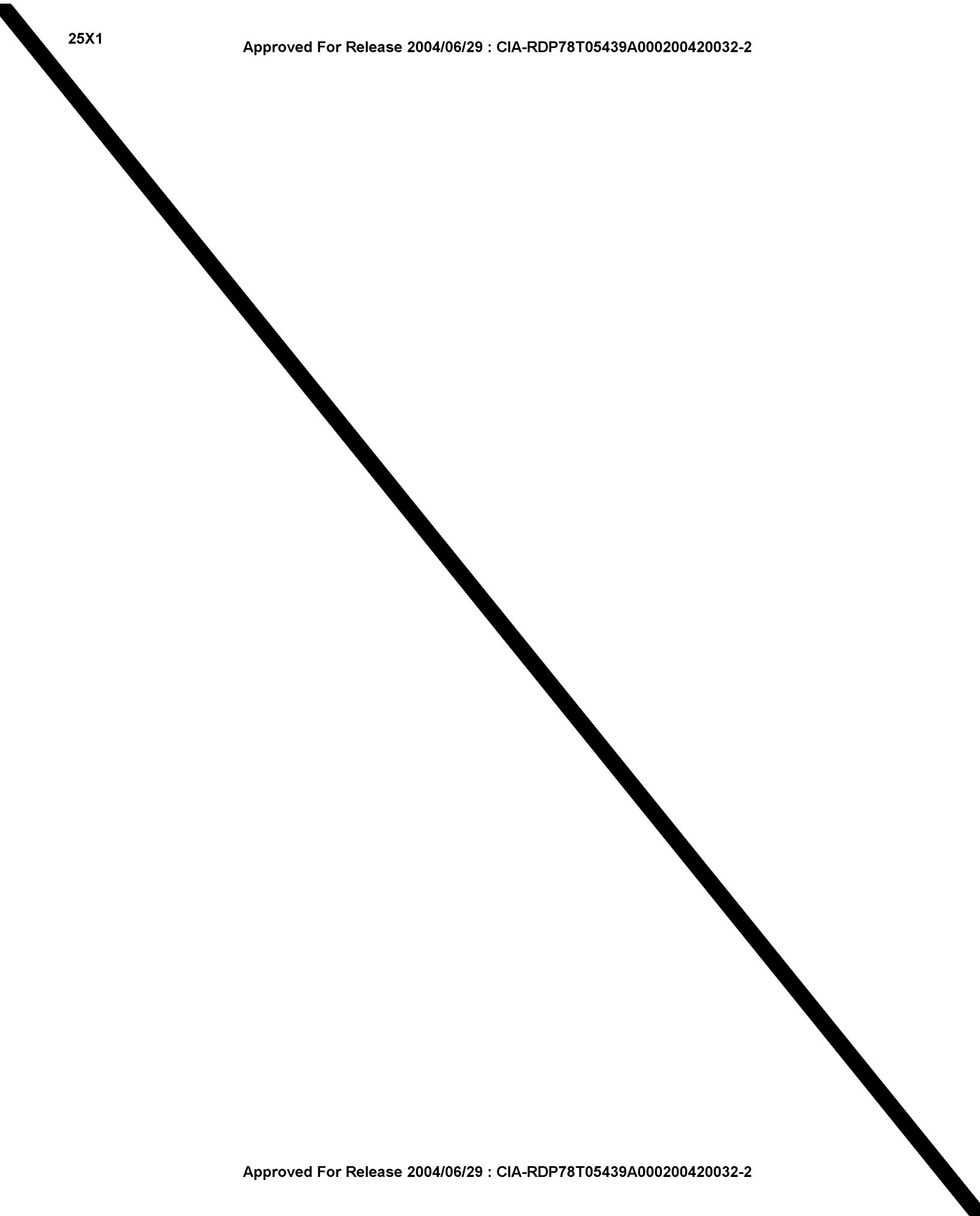

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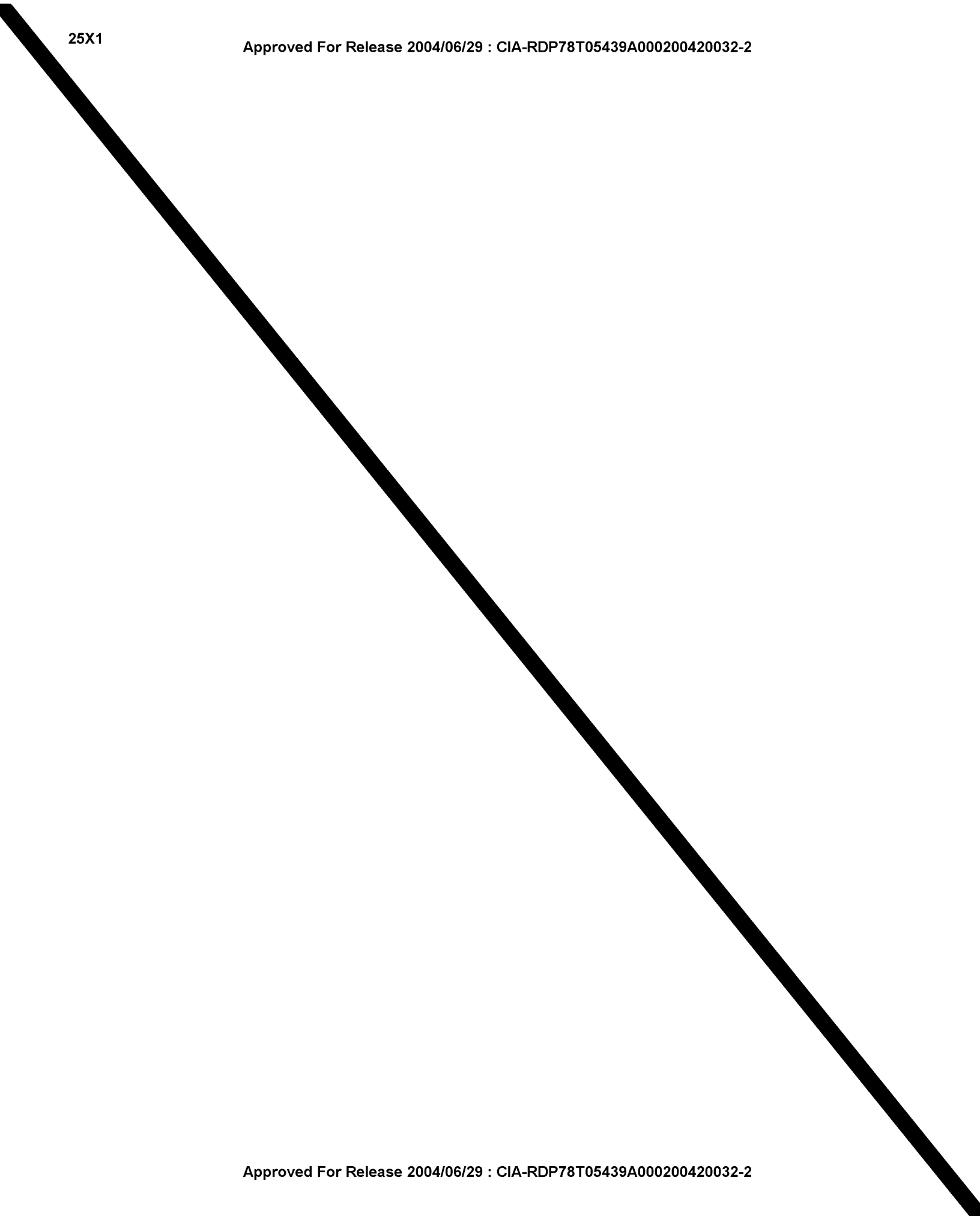
FIGURE 3. BAUTA RECEIVING STATION, [redacted]

25X1D



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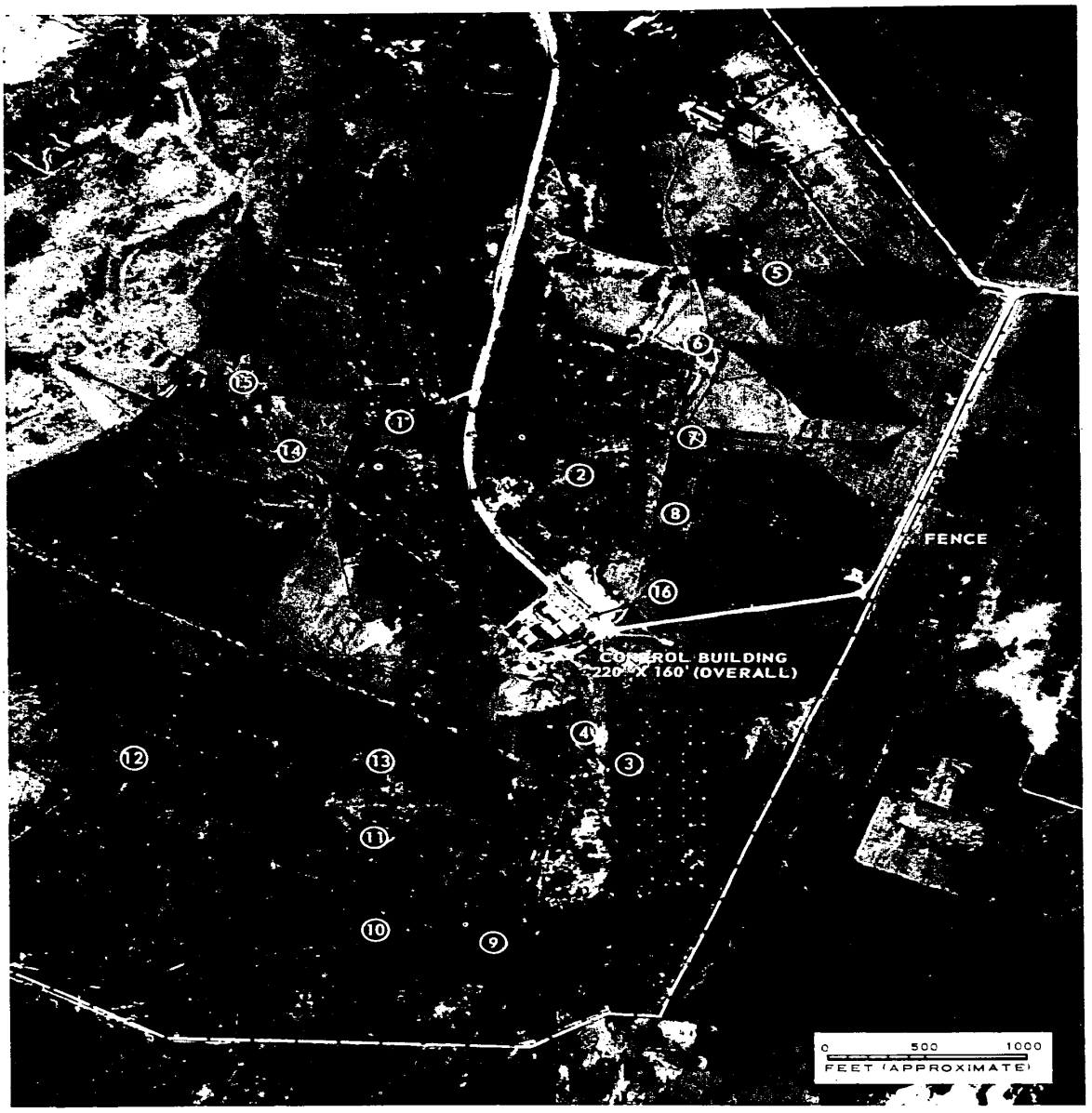
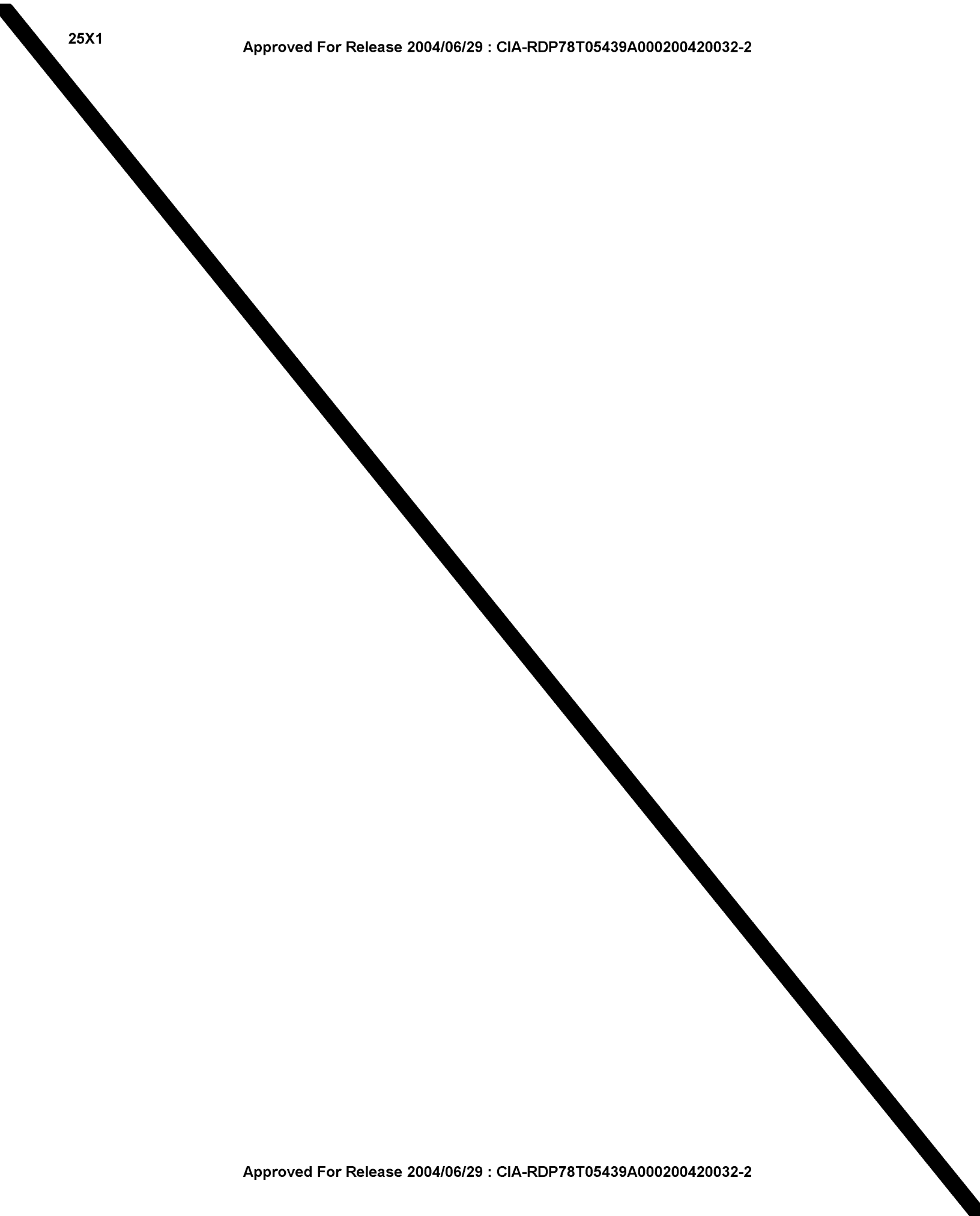


FIGURE 4. CALABAZAR RECEIVING STATION, [redacted]

25X1D



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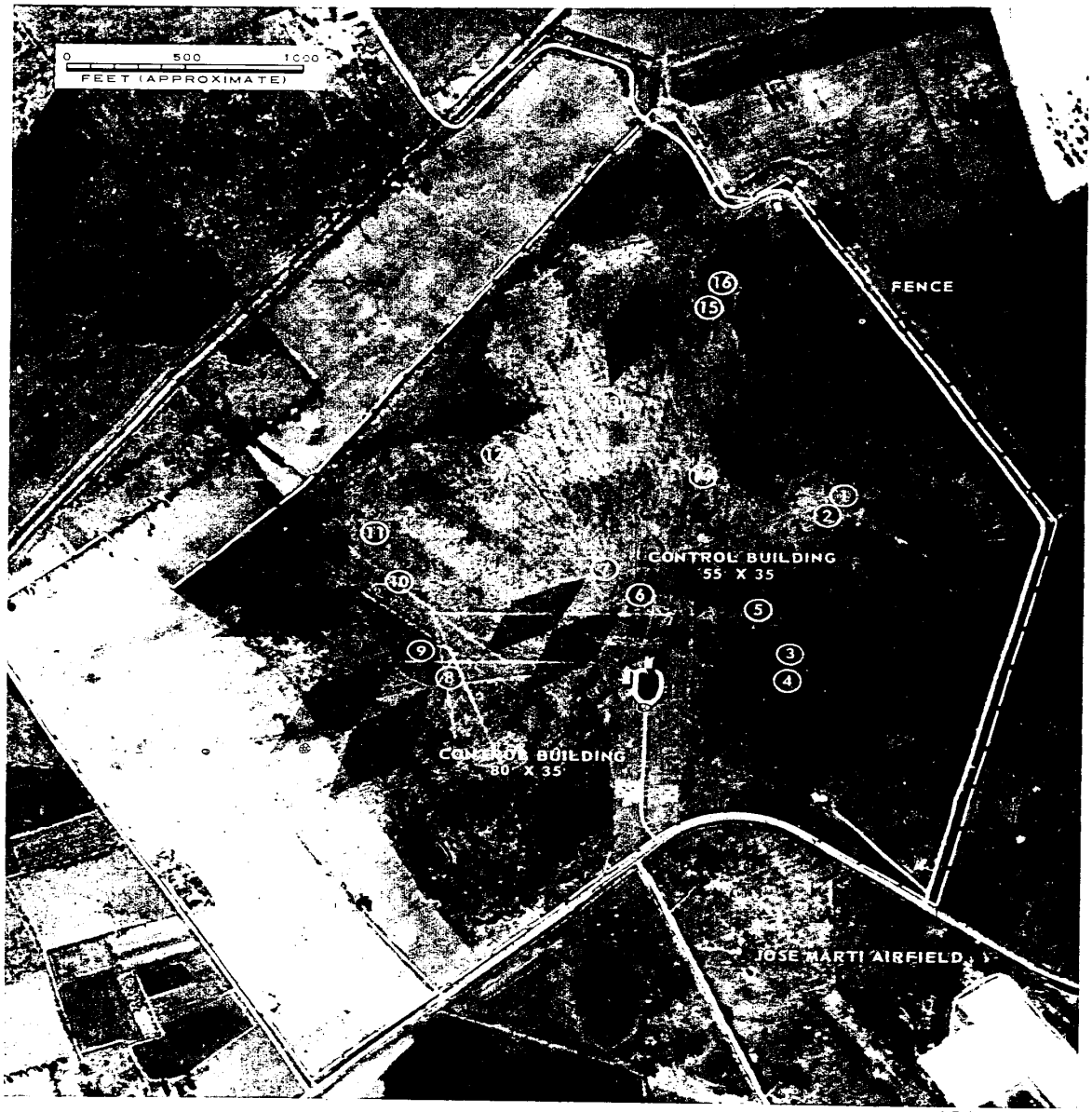

FIGURE 5. SANTIAGO DE LAS VEGAS RECEIVING STATION, [redacted]

25X1D

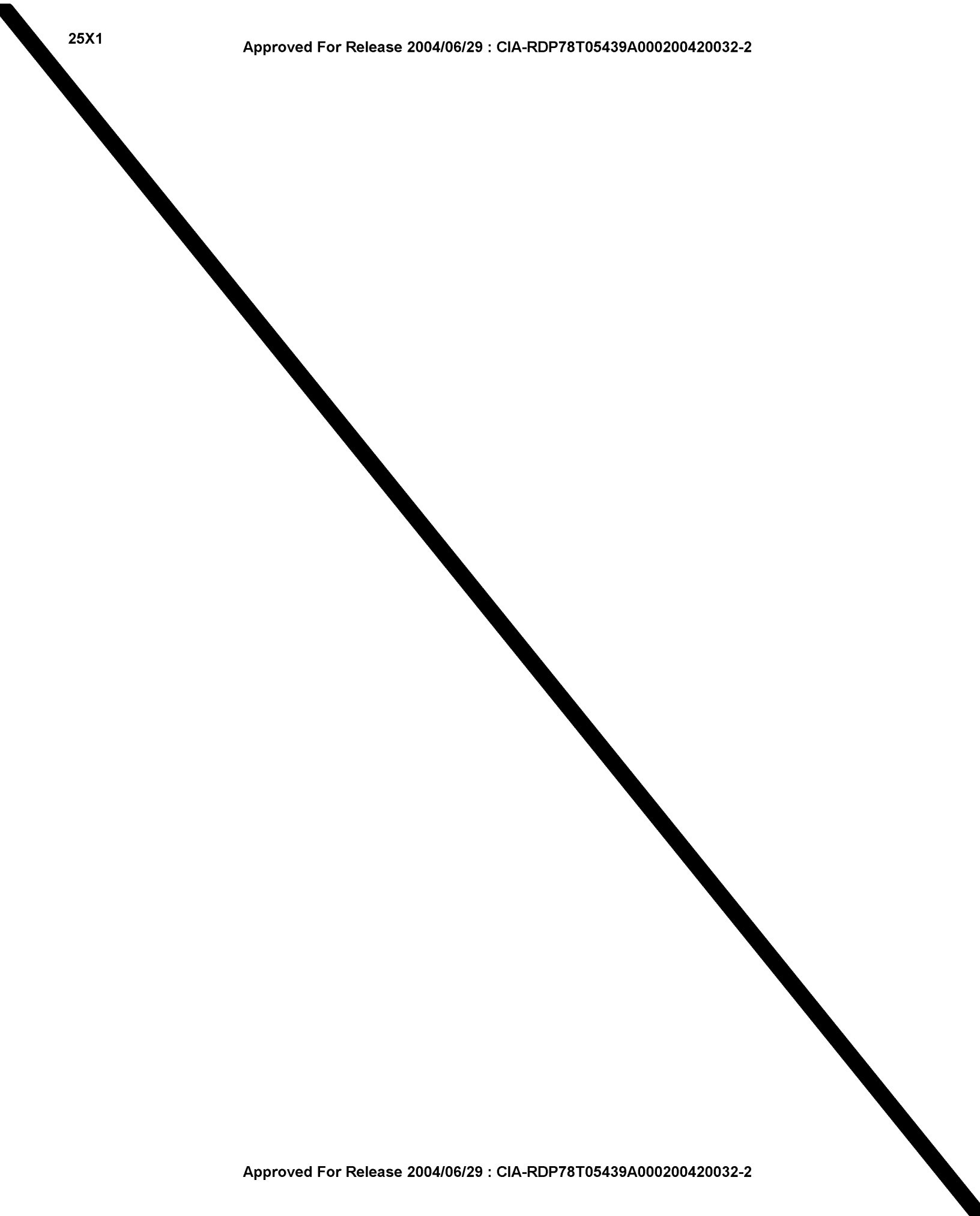

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FIGURE 6. CUATRO CAMINOS RECEIVING STATION, [redacted]

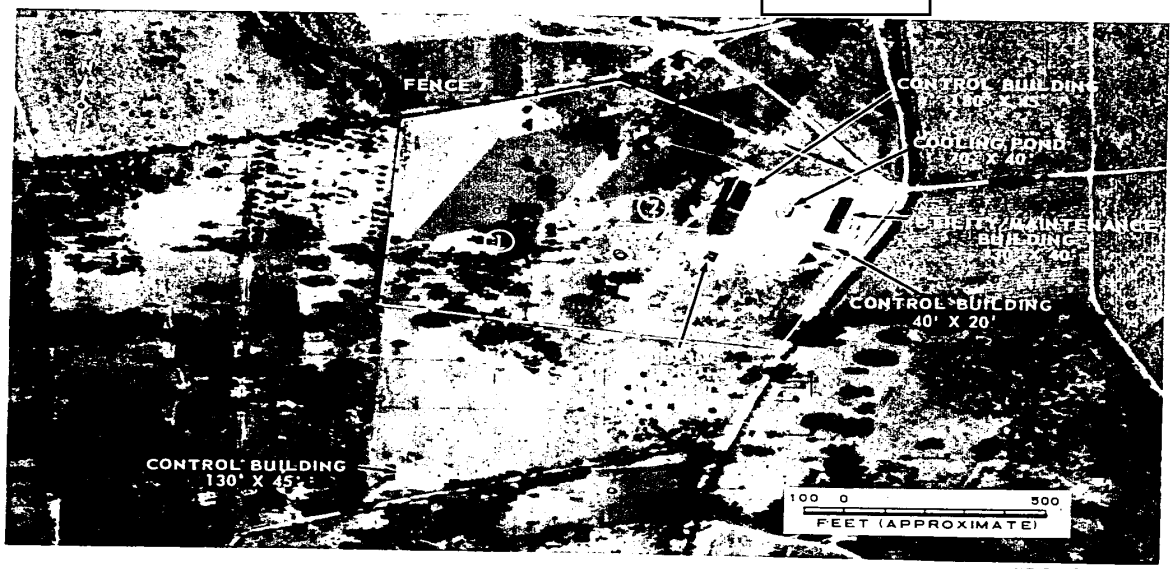
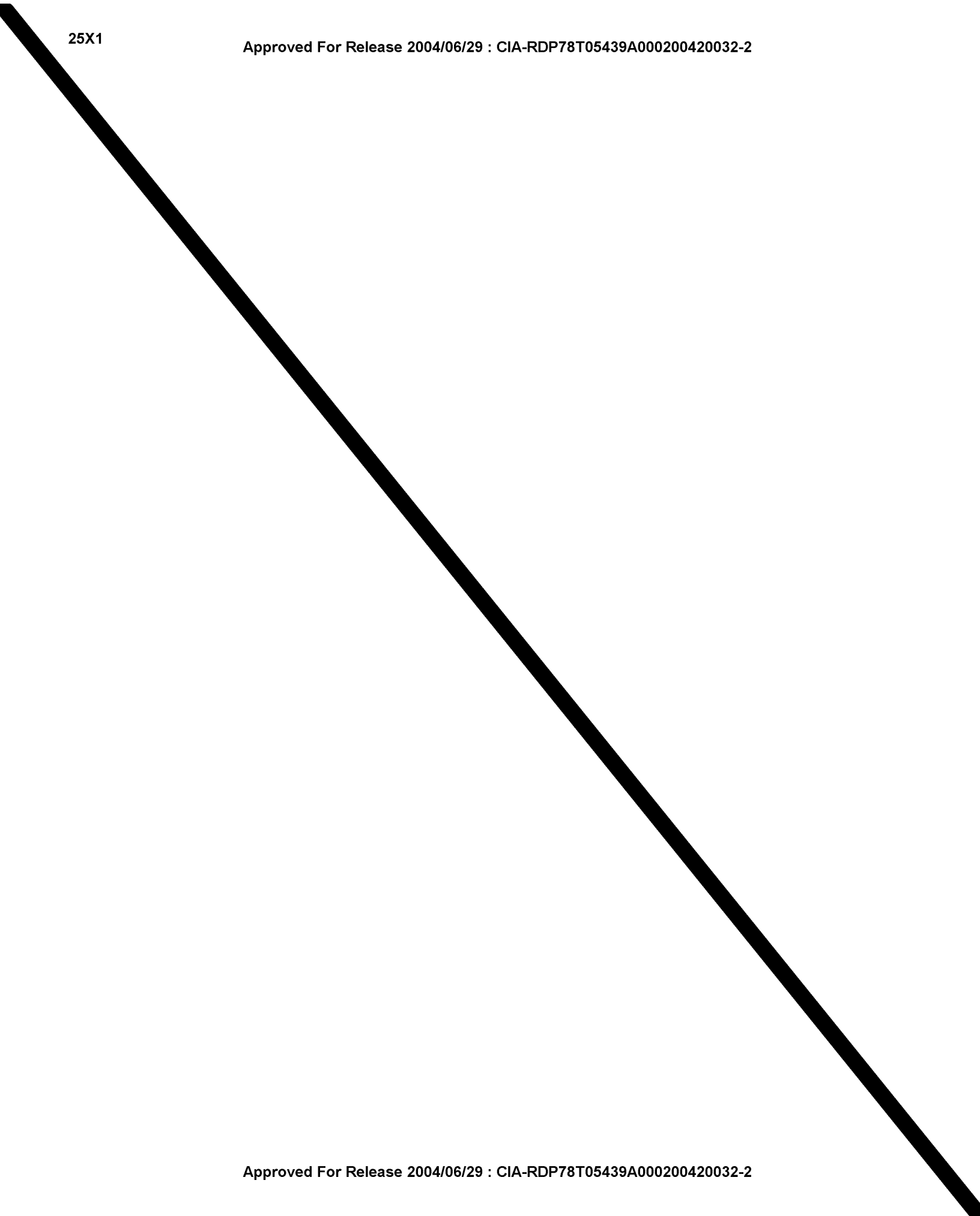


FIGURE 7. WAJAY TRANSMITTING AND RADIO BROADCAST STATION, [redacted]



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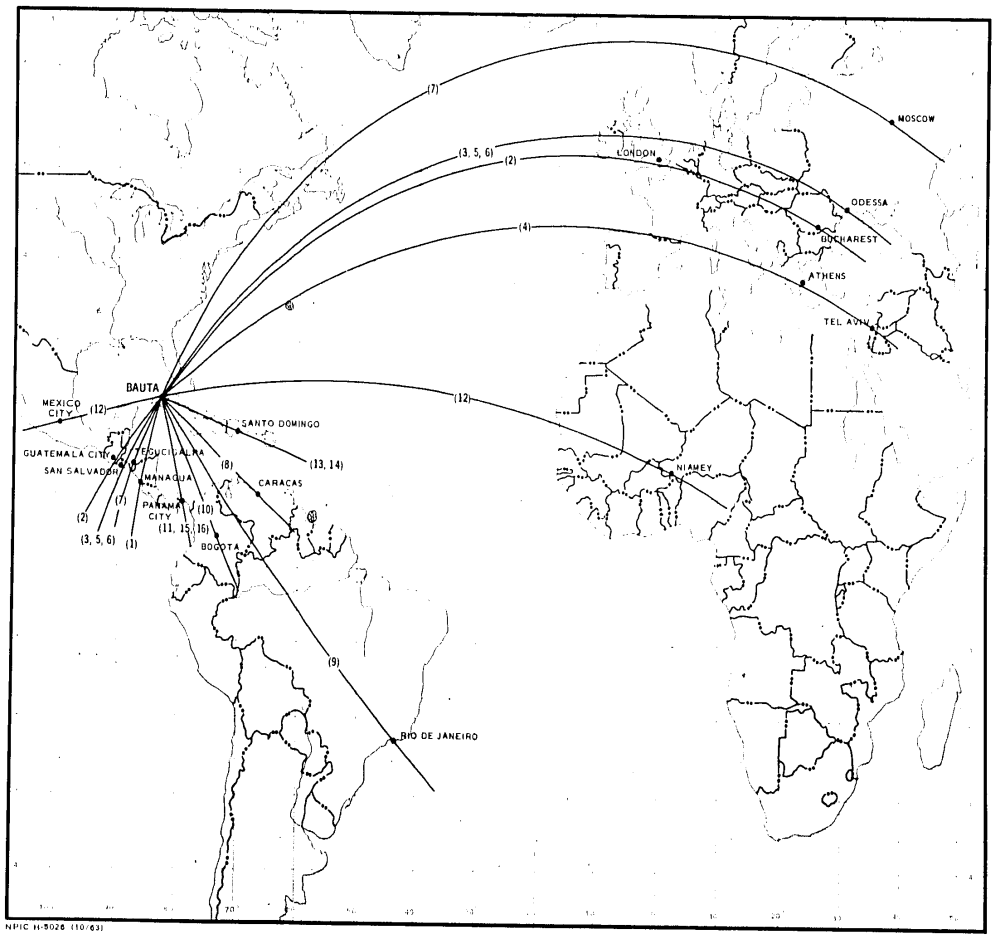

FIGURE 8. PROBABLE CORRESPONDENTS, BAUTA TRANSMITTING STATION.

SECRET

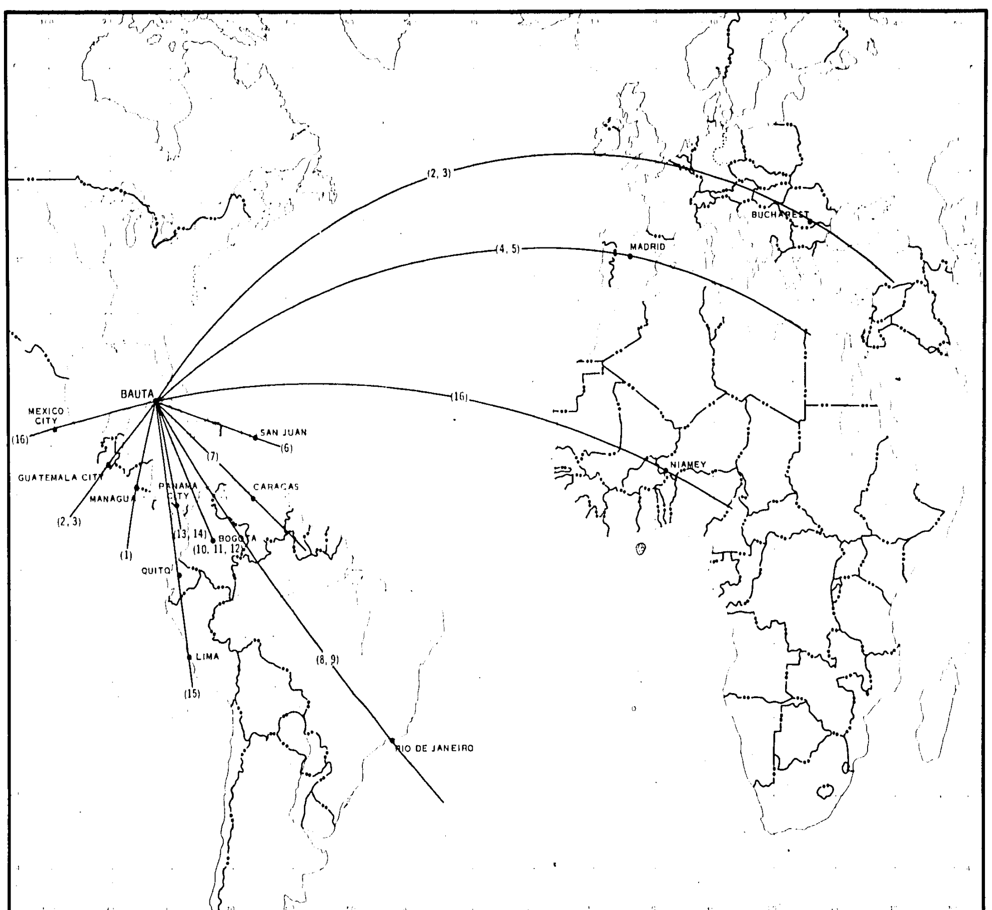

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FIGURE 9. PROBABLE CORRESPONDENTS, BAUTA RECEIVING STATION.

SECRET

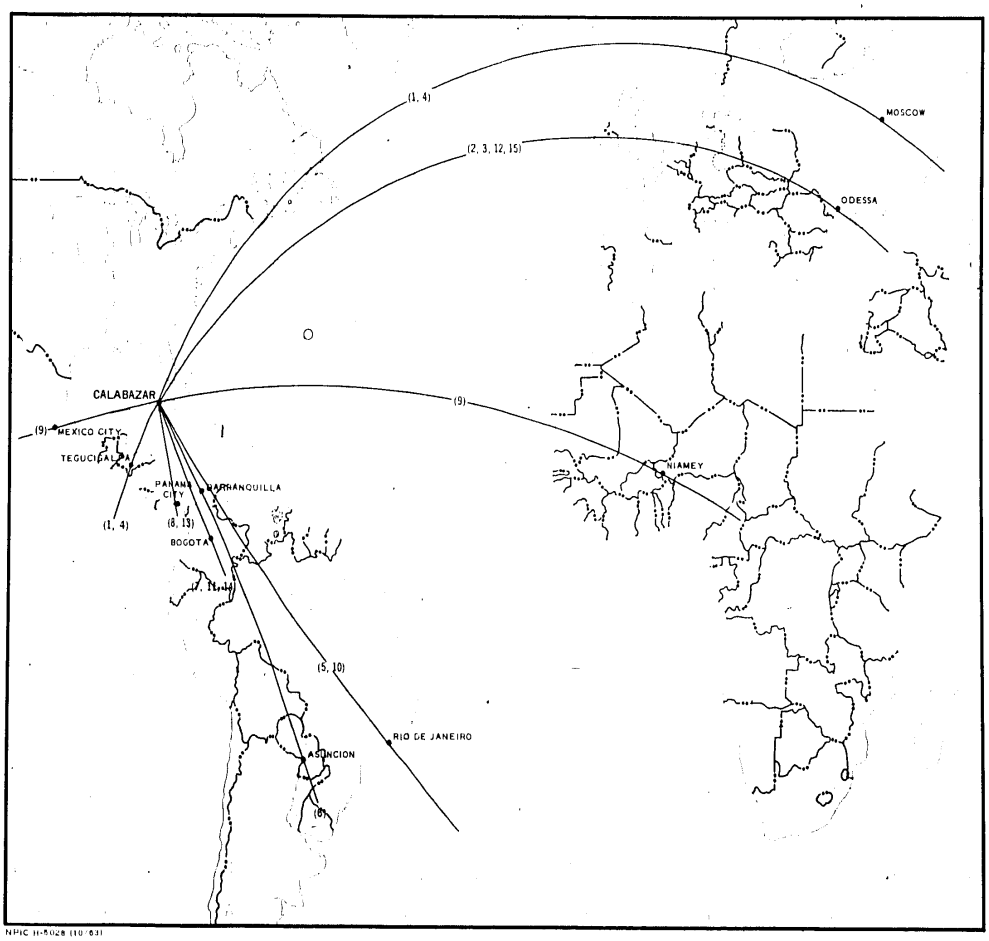

FIGURE 10. PROBABLE CORRESPONDENTS, CALABAZAR RECEIVING STATION.

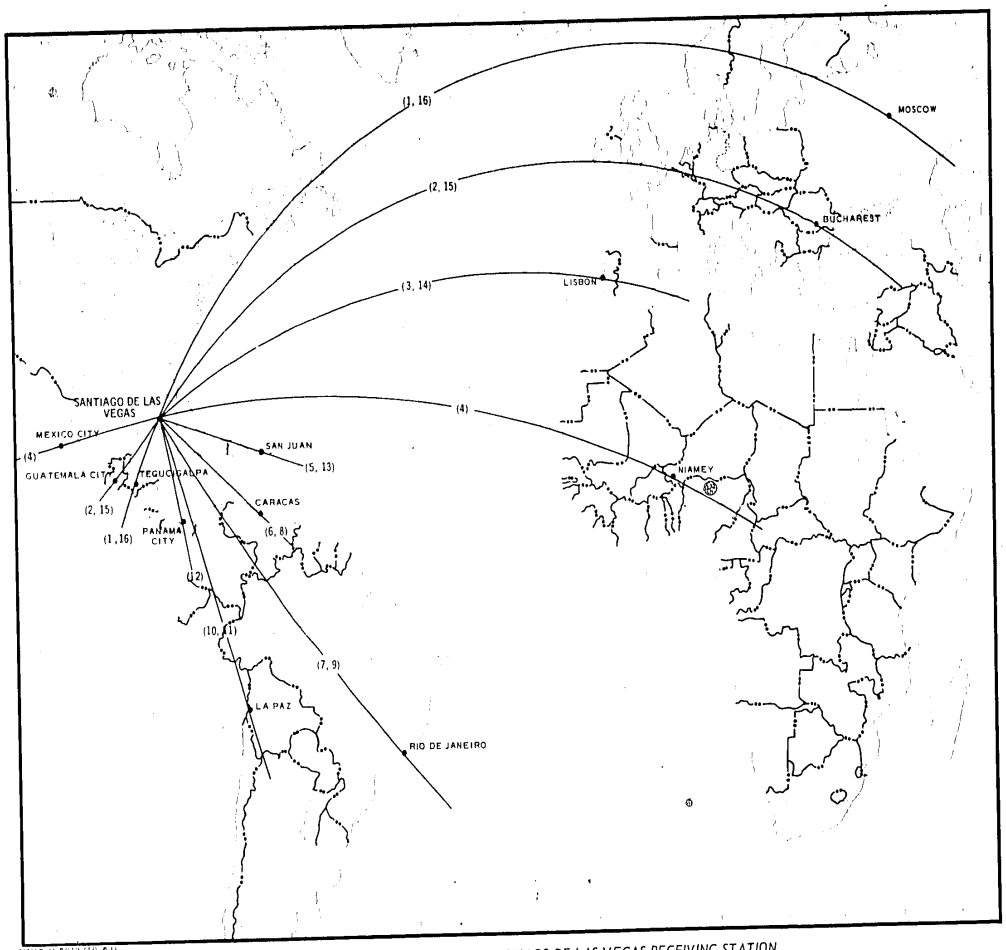

FIGURE 11. PROBABLE CORRESPONDENTS, SANTIAGO DE LAS VEGAS RECEIVING STATION.

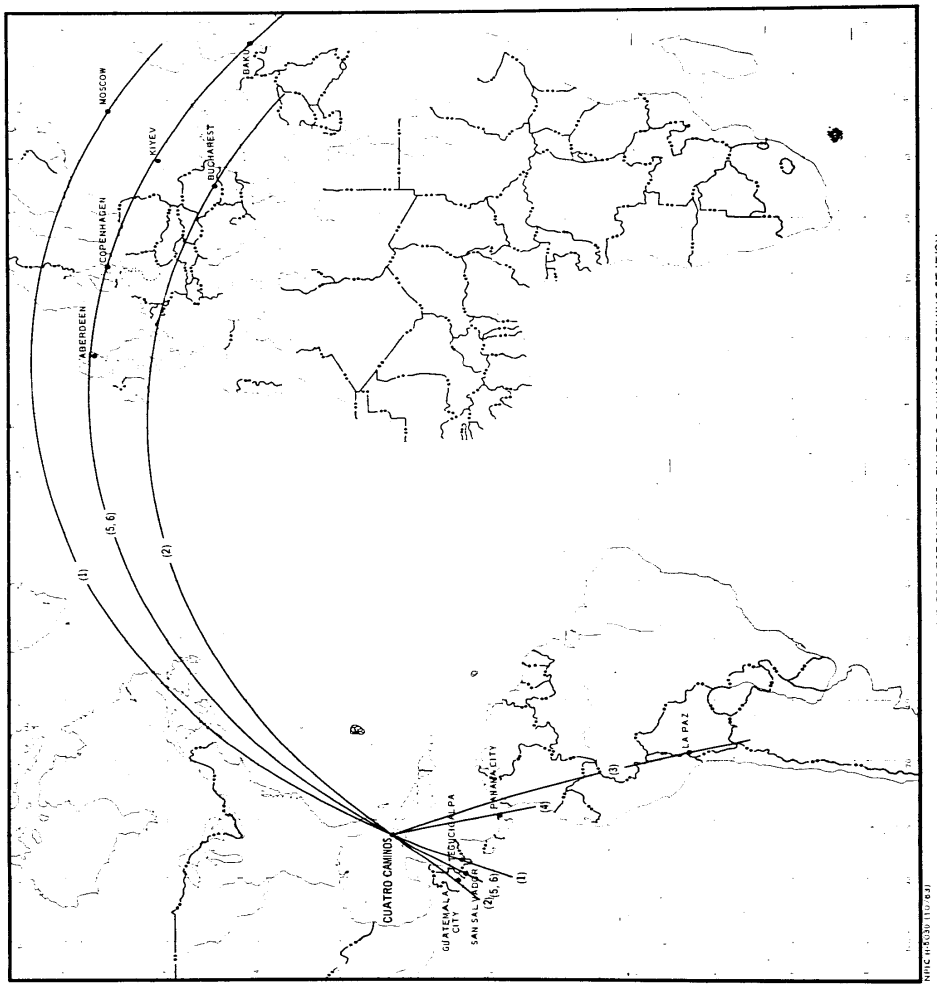

FIGURE 12. PROBABLE CORRESPONDENTS, CUATRO CAMINOS RECEIVING STATION.

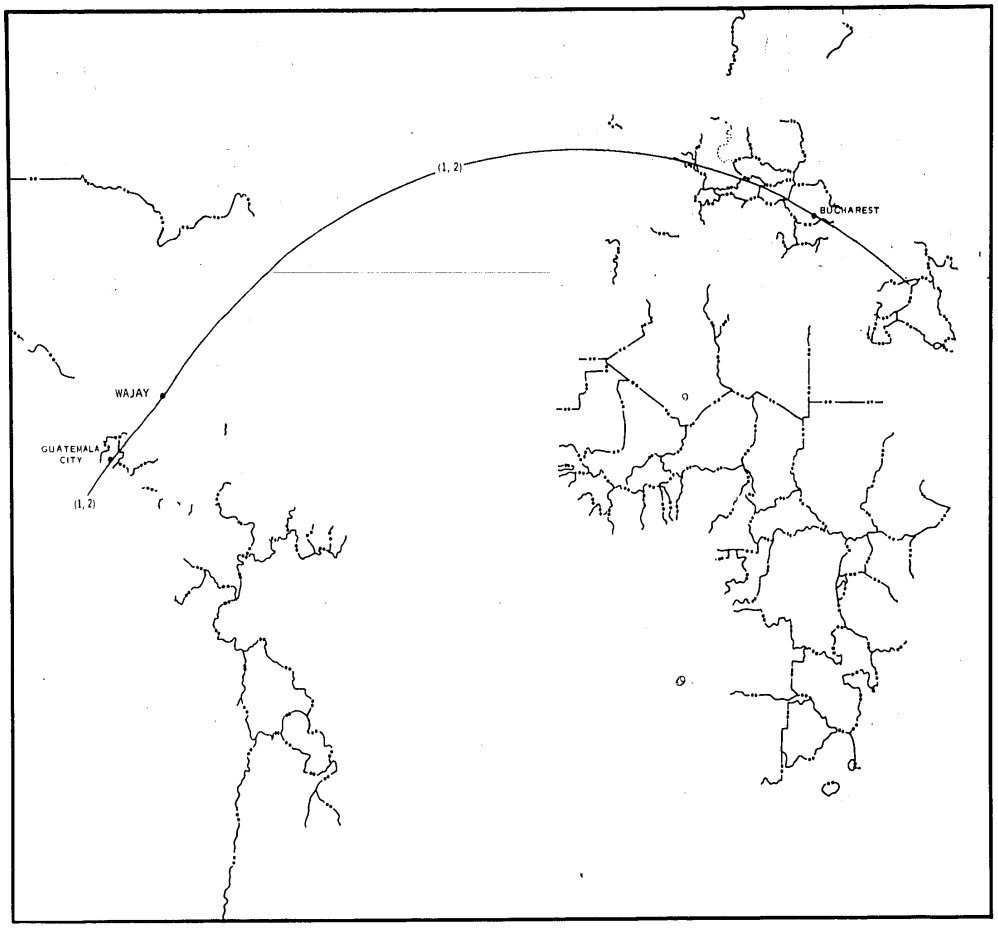

FIGURE 13. PROBABLE CORRESPONDENTS, WAJAY TRANSMITTING AND RADIO BROADCAST STATION.

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25X1D **ADDENDUM**

On photography of [redacted] a rhombic antenna farm was observed under construction at 22-52-12N 82-20-00W, 4.7 nautical miles southeast of Bejucal.

25X1D Though no poles are in place, a distinct
25X1D double rhombic pattern was identified on [redacted] photography, and a second double rhombic pattern was present 5 days later.* Ground scars in the area indicate that other antennas will be erected. It appears that the
25X1D site will be a transmitting facility.

[redacted]

Detailed characteristics of the antennas have not been fully determined as yet. However, the forward orientation azimuth projection of both antennas passes through Odessa, USSR, and the rear projection through San Salvador.

25X [redacted]

REFERENCES

25X1D

PHOTOGRAPHY

MAPS OR CHARTS

Bauta Transmitting Station
AMS Series E723, Sheet 3684I, 3d ed, Sep 60, scale 1:50,000

Bauta Receiving Station
AMS Series E723, Sheet 3784IV, 3d ed, no date, scale 1:50,000

Calabazar Receiving Station
AMS Series E723, Sheet 3785III, 3d ed, no date, scale 1:50,000

Santiago de las Vegas Receiving Station
AMS Series E723, Sheet 3784IV, 3d ed, no date, scale 1:50,000

Cuatro Caminos Receiving Station
AMS Series E723, Sheet 3785II, 4th ed, Nov 62, scale 1:50,000

Wajay Transmitting and Broadcast Station
AMS Series E723, Sheet 3785III, 3d ed, no date, scale 1:50,000

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25X1
25X1
25X1
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25X1

DOCUMENT

1. American Radio and Relay League. The A. R. R. L. Antenna Book, 1949

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REQUIREMENT

NSA. NSA P056 R-14 63

NPIC PROJECT

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